A Descriptive Analysis of Nonurgent Emergency Room Utilization

at William Beaumont Army Medical Center

Fort Bliss, Texas

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A Graduate Management Project

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14. ABSTRACT

The object of this study was to determine the percentage of patients seen in the WBAMCER for conditions triaged as nonurgent during a seven-month period from June to December in 1998. Additionally, the study, utilizing pre-recorded data, desired to determine if 12 independent variables were associated with nonurgent utilization of the ER. The registered nurses on duty triaged a total of 2,173 patients that met inclusion criteria. A large number (n=1260, 58% of sample) were triage to level 4 (nonurgent). Patients triaged to level 3 (treat within 24 hours) accounted for 37.8% (n=821). The remaining level two (urgent) and level one (emergent) accounted for nearly equal percentages of the population at 2.3% (n=49) and 2.0% (n=43) respectively. The typical profile of ER utilization by frequency showed the greatest usage by female active duty dependents between the ages of 18-35 who are CHAMPUS eligible and enrolled in TRICARE Prime. This profile also depicts the typical user as someone who presents with a sprain or strain on a weekday during the hours of 0700-1500. This profile is further typified by a person or sponsor between the rank of E5 and E9 with no third party insurance, lived in zip code 79924 (6 miles from WBAMC) and released without limitation after being treated in the ER. This study strengthens and quantifies the long-standing belief among practitioners and administrators regarding the prevalence of nonurgent use in the ER at WBAMC. These nonurgent patients may be candidates for referral to a more appropriate level of care, typically primary care, without a significant risk for deterioration of their condition. Identifying and quantifying this population is the first step in shaping important organizational initiative aimed at self-care education, utilization of telephone advice and triage, and other out patient medical management programs.

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Abstract

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INTRODUCTION

Background Information

Prevention of inappropriate use of the emergency room by means of a more appropriate use of primary health care is a major challenge of today's health care systems (Krakau and Hassler, 1999). Dating back to the 1950's, it was noted in the literature that the number of emergency room/emergency department (ER/ED) visits in the United States was rising dramatically and that many visits did not require emergency treatment (Shortliffe, Hamilton, and Nororuse, 1958). This trend has continued over the past five decades. A preponderance of the literature regarding the ER addresses issues of inefficiency, high cost, and over utilization (Alpert, Kosa, and Haggerty 1969; Buesching, Jablonowski and Vesta 1985; Gill and Riley, 1996; White and O'Connor 1970). The primary role of the ER/ED is to treat patients with life-threatening conditions, although that role continues to be expanded to include the treatment of a greater number of patients with minor illness. Over the past ten years there has been a 22% increase in number of ER/ED visits which in 1996 topped nearly 100 million (Hospital Statistics: Emerging Trends in Hospitals 96/97). The 1992 National Hospital Ambulatory Medical Care Survey concluded that approximately 55% of ED visits were for nonurgent problems. It is widely believed that at least half of all visits to emergency rooms are for minor medical problems (Brillman, Doezema, Tanberg, Sklar, and Skipper, 1997; Young, Wagner, Kellerman, Ellis, and Bouley, 1996; Office of Inspector General, 1993). The current health care environment and the expansive proliferation of managed care provide tremendous incentives to deliver comprehensive primary care that is contiguous and cost effective. Despite these managed care influences, the ER is being used at a high rate for nonurgent conditions.

The demand for services by nonurgent patients has resulted in overcrowding in many ERs nationwide. Providing care to this population often results in prolonged patient waits, delays in treating severely ill patients, and quality assurance issues. In addition, nonurgent use of the ER and prolonged waits can contribute to patient dissatisfaction and inefficiency. (Derlet, Kinser, Ray, Hamilton, and McKenzie, 1995; Stevens, Baker, Brooks, 1991) The reasons for ER overcrowding are complex and multifactorial and are not limited to nonurgent use. Common reasons cited in the current literature are the increase in total number of visits to the ER and prolonged stays in the ER associated with admitting patients when wards or intensive care unit bed are unavailable. Technological advances in emergency medical services and trauma care have expanded the scope of care provided. Staffing shortages and the nationwide decrease in the number of ERs have also contributed to overcrowding. (Derlet et al., 1995) The essence of this study is to provide a critical examination the clinical and demographic characteristics of a military beneficiary population accessing the ER in a large Military Medical Treatment Facility (MTF). This examination will provide baseline statistics for future studies to measure the impact of managed care implementation and demand management strategies on nonurgent emergency room utilization.

Conditions Which Prompted the Study

The study was performed at William Beaumont Army Medical Center (WBAMC), Fort Bliss, Texas. WBAMC is a medium size, 202-bed medical center (MEDCEN) located in El Paso, Texas. The hospital provides a variety of primary care and specialty services to its beneficiary population of approximately 65,000, of which 11,500 are Active Duty and approximately 35,000 are retirees (Management Branch, Director or Resource Management, Fort Bliss, Texas). Ten thousand are over the age of 65. Emergency services comprise a critical

component within WBAMC's health care system. WBAMC operates an emergency room staffed 24 hours a day and is capable of handling all levels of trauma. The ER's annual census is 41,000 visits per year (Medical Expense and Performance Reporting System, 1999). Like many medical centers, WBAMC contends with the challenge of simultaneously providing trauma care services and varying degrees of nonurgent care to those patients presenting to the ER. The demographic of the nonurgent population is relatively uncertain and had not been examined at WBAMC in a number of years.

Relevant to this study is the impact of organizational change and organizational focus on the consumption of healthcare. In particular, the implementation of TRICARE, the tri-service managed care program, in April 1997 had a tremendous impact on WBAMC and how the leadership views the delivery of health care. WBAMC, in addition to the surrounding city of El Paso, are challenged to incorporate managed care and the integration of the delivery, financing, and the consumption of healthcare. El Paso, a metropolitan city of approximately 750,000, continues to deliver health care in a fee-for-service environment, with less than 10% delivered through Health Maintenance Organizations (HMOs) (personal conversation 12 April 1999, Ms. Naida Sorken, Assistant Director, El Paso First Health Network). WBAMC continues to experience many challenges in developing a managed care system. Internally, WBAMC is focused on creating a staff model HMO that seeks to enroll eligible beneficiaries into the TRICARE Prime option and empanel each patient to a primary care provider. Meanwhile, the external TRICARE program attempts to build a support network in El Paso to complement WBAMC services.

During the TRICARE implementation phase, WBAMC was simultaneously experiencing a rather significant downsizing within the organization and, in particular, a number of residency

programs. This had a tremendous impact on the organization and the beneficiaries served. First, the platforms for specialty care in pediatrics and obstetrics and gynecology decreased. Secondly the organization experienced significant challenges in creating a primary care platform to empanel enrolled beneficiaries. In order to provide a primary care platform and meet TRICARE access standards within a downsizing environment, WBAMC was forced to curtail much of its space-available care to the Medicare-eligible population. This population is not eligible for TRICARE Prime, so they cannot be assigned to a primary care manager under the TRICARE system. This left many patients over 65 years of age with the ER as their only portal of access to care within WBAMC.

With the evolution of TRICARE, the incremental phasing in of capitated budgets is expected. As a result, MTF commanders are held responsible for the health of their enrolled population and for the delivery of health care on a fixed-price shared risk basis (Callender, 1994). In anticipation of MTF funding based on fixed–price per capita payments, WBAMC healthcare administrators and providers are seeking methods to reduce demand while maximizing appropriate use of services, as well as performing necessary services at a lower cost.

In mid-1998 WBAMC embarked on a systematic and focused process to create a strategic plan to guide the organization into the next century. This values-centered plan is focused on four distinct pillars: quality healthcare delivery, force readiness, education, and patient wellness. A goal within the strategic plan is to succeed under capitated financing. Supporting this goal is the objective: "We will measure our success by our ability to manage demand" (WBAMC Strategic Plan, 1999). The measure associated with this goal is directed at increasing appropriate utilization of healthcare services by 200% in the next fiscal year and concomitantly decreasing

inappropriate utilization by the same percentage. This study will provide a valuable baseline for such an analysis.

The philosophy of demand management was touted at the 1996 Alliance of Healthcare Strategy as becoming a core competency in every healthcare organization. R. Scott MacStravic Ph.D. envisioned demand management as an essential tool to "enable organizations under capitation to survive, prosper, and succeed." (Partridge, 1996). Current plans at WBAMC include a comprehensive healthcare package that centers on health and wellness promotion, disease prevention, and demand management through appropriate utilization of valuable medical resources. The antagonistic effect of demand management on inappropriate utilization substantiates the importance of research to validate the impact of these plans, particularly the examination of ER utilization in relation to nonurgent visits.

The Department of Defense program Put Prevention into Practice (PPIP) has particular relevance to this study. In February of 1998 WBAMC, a model site for the program, began instituting this multidisciplinary approach to educate and encourage patients to seek preventive care. Critical components of the PPIP program are the teaching of self-care classes to service members and their spouses and the use of the self-care books *Taking Care of Yourself* and *Taking Care of Your Child*. In addition, WBAMC's Community Health Nursing section and the Pharmacy, in alignment and support of the strategic plan, recently created a spin-off program that incorporated the self-care classes with access to over-the-counter medications in the pharmacy. Another critical program supporting the organizations demand management strategies is the implementation in April 1999 of the nurse advice line, operated by in-house WBAMC staff.

The key leadership of WBAMC is keenly interested in the impact these programs have on ER utilization, and what specific sectors of the population could be targeted for current and

future initiatives. The constraints placed on WBAMC make it necessary to maximize available resources in an effort to provide comprehensive health care services to our beneficiaries. This study will analyze the nonurgent population utilizing the ER. The results of this investigation can be utilized to modify and adapt our current health care system to improve efficiency and continuity of care for our beneficiary population. In addition, the results of this study will be incorporated into a WBAMC study involving the effects of Telenurse services on nonurgent use of the ER. If the Tri-Service Nursing Research Group Grant Proposal is funded, the design and results of this study will be leveraged into a multiyear study of the effects of Telenurse services on nonurgent utilization in the ER. These are compelling reasons that validate the necessity for studying ER utilization in a healthcare system undergoing significant change.

Statement of the Problem and Questions

ER utilization by patients with nonurgent conditions may contribute to overcrowding and impaired access for patients with true emergencies (Buesching, Jablonowski, and Vesta 1985; Baker, Stevens, Brooks, 1991). The focus of this study is on the clinical and demographic characteristics of patients identified as nonurgent during a seven-month period of time from June 1998 through December 1998 at WBAMC. What descriptive variables can be associated with nonurgent utilization of the emergency room during the study period? Are there demographic differences between urgent and nonurgent patients utilizing the ER within a medical center? A second follow up study could utilize the result of this study as a baseline to measure the impact of initiatives such as the Telenurse services and other demand management strategies on nonurgent utilization. Does ER utilization change in a managed care environment which focuses on demand management, self-care management, and use of Telenurse services for nonurgent conditions?

Literature Review

The literature review will focus on ER utilization, managed care's impact on ER utilization, and overall demand management strategies to reduce ER utilization.

A comprehensive study by the Government Accounting Office (GAO) (1993) revealed that of the nearly 100 million ER visits an estimated 42% of the patients were assessed as nonurgent. Additional studies cite nonurgent utilization as high as 50-55% (Hansagi, Carlsson, and Brismar 1992; Grumbach, Keane, and Bindman 1993). Nonurgent rates as high as 63% have been reported in the pediatric population (Simon, Ledbetter,and Wright, 1997).

A 1993 report by the GAO cited "the lack of a primary care provider" as the most prevailing reason patients present to the ER with nonurgent problems. Other studies have shown that reliance on the emergency room for primary care can result in emergency room visits for nonurgent problems (Jacobs, Gavett, and Wersinger 1991; Grumbach, Keane, and Bindman 1993). Baker et al in 1994 found that 16% of nonemergent patients presented to an ED identified it as their regular source of care (Baker, Stevens, and Brook 1994). In a study of ED walk-in patients, 25% identified the ED as their regular source of ambulatory care (Pane, Farner, Salness 1991). There are a significant number of persons that regard the ER as their regular source of care, and some research shows there is substantial difficulty in altering health care patterns in this group of people (O'brien, Stein, Zierler, Shapiro, O'Sullivan, and Woolard 1997). It appears logical that providing patients with a regular source of care should lead to a decrease in nonurgent utilization of the ER. However, two studies found that having a regular source of medical care has minimal impact on nonurgent utilization of the ER (Baker et al. 1994 and Gill and Riley, 1996). Furthermore, this supports efforts at not simply increasing empanelment to

primary care providers, i.e. enrolling patients in TRICARE Prime, but an analysis of primary care access and ER utilization to determine other factors associated with nonurgent use.

A study by Baker, Stevens, and Brooks (1995) found that the patient's perceived need for immediate care contributed to ER use for nonurgent conditions. Eighty-nine percent of the 1,190 patients at a public hospital in Los Angeles County, California felt they needed to be see immediately. Fifty-six percent of these patients were triaged out as nonurgent. Eight-two percent of the nonurgent patients in the Gill and Riley (1994) study rated their condition as urgent and expediency was the most common reason for seeking care in the ER. This study, as well as a 1993 study by Grumbach and colleagues involving primary care and ER overcrowding, concluded that the efforts to expand access to alternative ambulatory care sites may have little impact on ER use for nonurgent conditions if patients believe their problem constitutes an emergency. Vickery (1995) identifies perceived need as one of the components of his demand management model. The perception of the patients' nonurgent conditions is central to the demand management strategy, in particular, the teaching of self-assessment and self-care education.

Many studies show other factors are associated with increased frequency of ER use. Shesser et. al (1991) studied patients' motivation for nonurgent ER use and found nearly 25% of the patients chose the ER because of convenience, ease of use and accessibility. Proximity also appears to be an associated factor in ER use. Buesching et al. (1985) found an association regarding distance from the treatment facility and increased nonurgent utilization. Living near a hospital was shown to increase nonurgent use of the ER. Young and colleagues (1996) in a comprehensive study involving 56 ERs nationwide, identified a number of reasons for ambulatory visits to the ER. Reasons cited included, but not limited to, the inconvenience of

clinic appointment times, transportation problems, no other alternative for care, financial barriers to ambulatory care, and lastly confusion on how to access the healthcare system.

Studies regarding gender and age appear to be inconsistent in their findings. Research by investigators such as Anson et al. (1991) and Schesser et al. (1991) find an increase in men utilizing the ER, whereas other studies report little or no difference in utilization in relation to the patient's gender (Andren and Rosenquist, 1987). Studies on age, like those regarding gender, are very likely influenced by the demographics of the study population. One study that appears to address this influence is a 1994 study by Brown and Goel that surveyed over 60,000 individuals and weighted each response in relation to the overall population in an attempt at a representative sample. Age was found to be significant in relation to ED use and exhibited a U shape distribution, with the highest proportion of users in the youngest (0 to 5 years) and oldest age ranges (75 years and older). Incidentally, ages 0 to 5 years had the greatest number of visits, with 35% visiting the ER more than once.

Lastly, the time and day of week a patient presents to the ER appears to have an influence on nonurgent ER utilization. Tandberg and Qualls (1994) conclude the majority of patients present to the ER between the hours of 1400 and 2400. Regarding the day of the week, there is agreement among researchers such as Tandberg and Qualls, 1994; Lehmann et al., 1994; and Walsh, 1990 that nonurgent ER use increases when alternative care is unavailable.

Managed Care Impact on ER Utilization

A comprehensive study with direct relation to this research endeavor is the Kravitz et al. (1998) study of the effects of managed care on emergency department use. This study attempted to determine the effect of the Civilian Health and Medicine Program of the Uniformed Services (CHAMPUS) Reform Initiative (CRI), a risk-sharing HMO option, on ER utilization. This expansive project had 1.2 million beneficiaries in 11 military hospital catchment areas participating. Visits to the ED during two 12-month periods, before and after institution of CRI, were compared. Under CRI (managed care option), the number of CHAMPUS ER visits decreased by approximately 40% relative to the control, those utilizing standard CHAMPUS. Reductions in ER use were concentrated among repeat users and patients with less severe illnesses. This study shows that a managed care program operating within the Military Health System can dramatically reduce ER utilization.

The remaining research is not as conclusive. Managed Care Organizations (MCOs) attempt to divert and influence patients with suspected inappropriate concerns away from the ER by requiring pre-authorization, and charging co-payments and deductibles, in addition to the denial of claims based on lack of urgency. Inconsistencies abound in these efforts to decrease nonurgent utilization. A University of California-Davis study concluded that patients could be safely identified as nonurgent and refused care (Derlet, and Nishio, 1990). Meanwhile two other studies found that a low, but disturbing number (5%) of patients with serious conditions were misclassified and the delay in treatment exacerbated their condition (Lowe, Bindman, Ulrich, 1994; Birnbaum, Gallager, Utkewicz, Ginnis, and Carter, 1994).

The managed care industry and to a large extent the clinical community struggle with efforts to define what is an "inappropriate" ER visit. There is no widely accepted definition to measure appropriateness (Baker et al. 1991, and Derlet and Nishio, 1990). Even with a

successful endeavor such as the Maryland Access to Care initiative that adopted strict

gatekeeping and managed care tenets, adverse outcomes did result. These few preventable

deaths were attributed to controlled access to the ER. The state of Maryland dropped the program

despite saving money (Gadmoski et al., 1995).

The most pervasive technique that affects the utilization of emergency services is the

establishment of a co-payment to use the emergency department for services categorized as other

than a true emergency. This is part of an overall strategy to influence the location of care (ER

versus primary care) and the specific type of provider (ER physician versus primary care

provider) the member utilizes when consuming nonurgent care. Two studies concluded similar

results regarding the effects of co-payments on nonurgent ER utilization. Both O'Grady and

colleagues (1985) and Selby and colleagues (1996) found that co-payments reduce ER utilization

by as much as 15%, mostly among patients with conditions considered nonurgent.

Effects of Demand Management Strategies on ER Utilization

Demand management is gaining wider acceptance throughout the medical community.

This is, in part, due to the fact that many of the tools for demand management have been

available for over two decades (Partridge, 1996). Demand management relies on information

passed to consumers in a variety of ways including phone triage systems, educational material,

and self-care manuals. The goal of demand management is consumer empowerment to make

better decisions regarding healthcare utilization. In essence, demand management results in

appropriately utilizing the available healthcare resources at the appropriate level (Vickery, and

Lynch, 1995).

There is a growing trend toward the use of nurse advice lines (NALs) to facilitate

consumer empowerment and appropriate utilization of the direct care system.   According to

research, perceived need appears to be the best predictor of a person's decision to seek medical

care. Berkanovic, Tleseky, and Reeder (1981) explained 42% of the variability in tendencies to

seek care could be attributed to perceived need. Patients are often unsure of whether their

condition is urgent, and seek care in the ED to alleviate this uncertainty (Padgett and Brodsky,

1992). The NAL is focused on empowering patients with information to clarify their need for

healthcare and to facilitate better decisions regarding accessing the appropriate level of care

when utilizing the healthcare system. Nurse Advice Lines are a component of the Department of

Defense's demand management plan and are an integral part of health care services in every

TRICARE region. Recent studies demonstrate the positive impact the NAL has on managing

demand and facilitating appropriate use of health care resources. In a study involving the

Wisconsin Public Schools (Barnet, 1995) employees with access to 24-hour nurse counselors and

a self-care manual were compared against a group not having access to either. Analysis revealed

those with access to the nurse counselor and self-care manuals had savings of on average $46 per

year over those with no access. Brumfield (1995) found similar results in a study involving the

introduction of a NAL. Despite the wide spread use of NALs in the Military Health System

(MHS) there is a lack of published research evaluating or benchmarking this important demand

management initiative.

The results of studies regarding the impact of demand management strategies using self-

care manuals are encouraging. A study by Vickery et al. (1988) found approximately a 15%

reduction in ambulatory visits and a 35% decrease in minor illness visits among a population

using self-care manuals. What makes this study particularly relevant to WBAMC is that the

written education material used was the *Taking Care of Yourself* and *Taking Care of Your Child* handbooks that WBAMC currently provides for their self-care education classes. The impact of providing medical consumers with information and guidelines concerning self-management is demonstrated in other studies and shows consistently to decrease utilization by 7 to 17 percent (Fries et al. 1993; Terry and Pheley 1993). Particularly relevant is the 1998 study by Steinweg et al. that examined the impact of a self-care program coupled with free access to over-the-counter medications at Leonard Wood Army Community Hospital, Fort Leonard Wood, Missouri. Seventy-two percent of the participants reported avoiding at least one clinic visit and nearly 40% reported avoiding at least one ER visit. The calculated return on investment was an impressive 11:1. The study concluded that a formal self-care program supported by a pharmacy can result in cost-effective demand management.

In response to the increased cost and volume of nonurgent emergency room visits, hospitals across the nation continue to develop and expand "fast tracking" or urgent care centers (Buchanan and Powers, 1996). These systems are designed to divert patients with low acuity conditions away from the emergency room while not denying them immediate access to care (Simon, Ledbetter, and Wright, 1997). A large study involving 250 health facilities nationwide concluded the mean estimated percentage of ER patients going through fast track systems was 30.1% (Ellis and Brandt, 1997). Typically these fast tracks were operating 12 hours per day both on weekdays and weekends. These efforts are primarily aimed at timely treatment of nonurgent patients at the appropriate level within the healthcare system. As many as 31% of the teaching hospitals nationwide are utilizing physician assistants and nurse practitioners in their ERs and fast track clinics in an effort to decrease staffing costs (Holly, Kellermann, and Andrulis, 1992; Ellis and Brandt, 1997). Patient acceptance and satisfaction of physician assistants and nurse

practitioners are reported in the literature to be excellent (Sturman, Ehrenberg, and Salzberg, 1990; Rhee, Dermyer, 1995). Ellis and Brandt (1997) in their concluding remarks allude to the growing trend of managed care organizations insisting that hospital ERs establish or maintain agreements to provide nonurgent care to manage care subscribers by offering fast track service. Fast tracking and the use of urgent care clinics nationwide has allowed healthcare facilities to improve patient satisfaction, shift patients to a more appropriate level of care, and decrease cost while maintaining market share of the nonurgent care population (Simon, Ledbetter, and Wright, 1997).

Purpose

The purpose of the study is to critically examine emergency room utilization and descriptive characteristics of patients seen in the ER for nonurgent conditions at WBAMC during a seven-month period of time. This study will examine nonurgent utilization, the dependent variable, as a function of twelve independent variables: patient's age, gender, beneficiary status, grade/sponsor's grade, time of arrival, day of the week, if covered by other health insurance, distance from facility, enrollment status in TRICARE, unit of assignment, disposition category, and diagnosis related group by International Classification of Disease-9 code.   In determining if nonurgent utilization can be predicted, the alternate hypothesis (Ha) is: nonurgent use of the ER varies as a function of patient's age, gender, beneficiary status, grade/sponsor's grade, time of arrival, day of the week, other health insurance, distance from facility, enrollment status, unit of assignment, disposition category, and diagnosis related group. The null hypothesis (Ho) is: nonurgent use of the ER does not vary as a function of the twelve independent variables.

METHOD AND PROCEDURES

Study Sample

The population studied consisted of a sample of patients that presented to the Emergency Room of William Beaumont Army Medical Center during a seven month period from June to December in 1998. In an effort to attain a random sample four randomly selected days, one from each week was chosen from a random number table. The days selected were the 3rd, 12th, 18th, and 24th for each of the months from June 1998 to December 1998 and totaled 28 days of patient data and a total sample size of 2,660 patients. By selecting the same dates in successive months the sample achieved a representative number of weekend and weekdays in the seven months proceeding the anticipated implementation of the nurse advice line in January 1999.

The logging in, assessment and triage of each patient is crucial to the analysis of this study. Each patient presenting to the ER is logged into the front by the desk clerk and a standard form 558 (SF558) generated for documentation of the encounter. The patient was also logged into CHCS (Composite Health Care system), a registering and physician ordering system, and an ADS (Ambulatory Data System) bubble sheet is generated through an interface between the two systems. The ADS is a database designed to gather information on each outpatient encounter. The critical piece of data for defining the population in this study was the triage level.

The ER developed an Ad Hoc report in CHCS, which they use to crosscheck and validate that a SF 558 is filed for each patient logged into the ER. This report is a complete list of all patients that were logged into the ER in a 24-hour period. This report was use during this study to crosscheck against all SF 558s filed for each study date in an attempt to account for all patients. Upon reviewing of all SF558s against the CHCS ER Ad Hoc report only 40 (1.5 % of sample) could not be located.

ADS data was collected on 2,660 patients for the 12 variables listed and 2,173 (82%) were included in study analysis. Inclusion criteria consisted of being on the ER Ad hoc report, being in the ADS database for the study day, and lastly having a SF558 and triage category. A large number 487 (18%) of the 2,660 patients were eliminated from the study for the following reasons: no triage classification 69.5% (n=337); SF 588 missing or administrative error 4% (n=20); incomplete ADS data 3.6% (n=18); error in ADS patient file consisting of a mismatch between ER Ad Hoc report and ADS file 23% (n=112).

Triage Process

Since June of 1997 the ER at WBAMC has utilized a standard operating procedure (SOP) for the evaluation and triage of all patients presenting to the ER. The triage process consists of the use of written unpublished guidelines created by WBAMC ER staff physicians. These written procedures are based on ER staff agreements regarding the standards of care and are a compilation of existing triage protocols from other MTFs. The written guidelines provide the registered nurse a systematic procedure, based on symptomology, to evaluate and determine the acuity level of the patient. Vital signs were taken and the patient was asked a series of focused questions regarding their condition. Based on the information given and the assessment performed by the registered nurse, the patient was placed into one of five triage levels of urgency. The triage level is manually written on the SF 558.

Triage levels defined:

Level 1: Patient must be seen immediately by an emergency room physician to prevent potential loss of life, limb or eyesight. Examples include suspected myocardial infarction, altered level of consciousness, or cardiopulmonary arrest.

Level 2: Patients that require urgent (prompt) emergency room care within 1 hour to prevent possible life threatening deterioration. Examples include moderate asthma, suspected appendicitis, open fractures.

Level 3: Patients with stable conditions that require timely treatment (within 24 hours), but do not have life threatening condition, nor conditions that are likely to soon become life threatening. Examples include uncomplicated urinary tract infections, back strain, dehydration, minor orthopedic injuries, minor lacerations.

Level 4: Patients with stable conditions that require treatment when available and are not at risk for significant deterioration should there be a delay in care. Examples include uncomplicated soar throat, acne, allergy symptoms, mild back pain. Patients in this category are typically directed to make an appointment with their established care provider.

Level 5: Patients with stable conditions that may require care in a primary care setting. Patients are also directed to make an appointment. The triage nurses seldom use this triage level (less than 5%). Patients in this category were grouped with level four for analysis. Examples include medication refills, wellness visits, and school physicals.

Triaging of patients is a very difficult task for the nurse and requires both objective and subjective data to be considered during the patient evaluation. All triage nurses were registered nurses and had a minimum of 2 years experience in the ER. The overall goal of triage is the prioritizing of patients to ensure they are seen in order of medical necessity. The triage nurses are

encouraged by the staff physicians to err on the side of triaging patients to a higher priority, realizing that this decision has direct bearing on the individual patient as well as other ill patients waiting to be seen by a provider.

Study Design

This investigation utilized a non-experimental research design using pre-recorded data to measure frequencies of a number of variables collected on patient visits to the emergency room over a 7 month period. This design closely parallels the design used by Major Gamerl at Fort Sill in 1996 to evaluate the impact of TRICARE on nonurgent utilization in the ER (unpublished Baylor manuscript, 1996). The non-experimental design has been suggested for this type of study (Oyster, Hanten, and Llorens, 1987).

The data sources for the study came from the SF558, Composite Health Care System (CHCS), Medical Expense and Performance Reporting System (MEPRS), and the Ambulatory Data System (ADS). SF558 provides the triage level. CHCS provides an accurate account of patients presenting to the ER and a reference to verify the completeness of ADS files for each study day. ADS provide the database for the 12 independent variables studied. MEPRS provides the total number of visits to the ER.

Descriptive statistics for the 12 independent variables were calculated using the Statistical Package for the Social Sciences (SPSS) version 8.0. Data for the analysis was taken from the ADS and consisted of the 12 independent variables mentioned for each of the study days. The ADS data was placed in an Excel® spreadsheet. The triage level of each of the 2,173 patients was taken from the SF558 and entered into the Excel® spreadsheet. Inter-rater reliability for 100 random patients over the 28 days selected revealed 100% accuracy of each

patient's triage level entered into the spreadsheet. The Excel® spreadsheet was then imported

into SPSS. In SPSS, the 12 variables were further stratified and recoded into mutually exclusive

and categorically exhaustive groups. This process yielded a total of 55 catagories in 12

variables. Each variable was given a separate column and coded 1 if in the category and 0

otherwise. Patient anonymity was maintained throughout the research process. All identifiable

characteristics (name and social security number) were eliminated from all data collection

material to include all Excel® and SPSS® files.

A comparison of means was performed using a two-sample independent students *t* test

for nominal data and chi-square test for all categorical data. Differences were considered

significant at p<0.05 level. Triage level 1,2, and 3(urgent) were grouped for statistical purposes

against level 4(nonurgent).

RESULTS

TABLE 1. TRIAGE LEVEL PERCENTAGES FOR WBAMC ER

	Triage Level				
	1	2	3	4	Total
n	43	49	821	1260	2173
% in level	2.0%	2.3%	37.8%	58%	

Level of care. The registered nurses on duty during the data collection period triaged a total of 2,173 patients that met inclusion criteria. A large number (n=1260) were triage to level 4 (nonurgent). This equated to 58% of the sample. Those patients within level 3 (needing treatment within 24 hours) accounted for 37.8% (n=821). The remaining level two (needing care within 1 hour) and level one (needing care immediately) accounted for nearly equal percentages of the population at 2.3% (n=49) and 2.0% (n=43) respectively.

TABLE 2. TOP TEN DIAGNOSIS BY TRIAGE LEVEL BY FREQUENCY

| | Triage level | | | | | | | |
Diagnosis	1	2	3	4	Total	% Sample	% level 4	Mean Triage Level
1.) Sprain/ Strain	1		31	62	94	4.3	66%	3.6
2)Abdominal Pain	1	2	88	50	141	6.5%	35.5%	3.3*
3)Contusions unspecified	1		26	44	71	3.3%	62.0%	3.6
4)Urinary Tract Infection			19	42	61	2.8%	68.9%	3.7
5) Rash, other skin eruptions			11	39	50	2.3%	78.0%	3.8*
6) Acute Otitis Media			21	33	54	2.5%	61.1%	3.6
7) Acute Upper Respiratory Infection		1	9	32	42	1.9%	76.2%	3.7
8) Acute Bronchitis	3	2	18	30	53	2.4%	56.6%	3.4
9)Gastro enteritis Colitis			20	27	47	2.2%	57.4%	3.6
10) Unspecific Viral Infection			19	26	45	2.1%	57.8%	3.6
Total	6	5	262	383	658	30.3%		

* $p < 0.001$, chi-square for urgent(level 1,2,and 3) vs. nonurgent (level 4)

Diagnosis. Noted in table 2 30% of the entire ER population can be accounted for by the 10

diagnosis listed. Sprain/strain accounted for the highest number of nonurgents (n=62). Although

abdominal pain accounted for the highest total number of patients (n=141) of the top 10

diagnosis, these patients were more acute and less apt to be nonurgent with a mean triage level of

3.3 the lowest among the top 10 diagnoses. Diagnosis that related to respiratory conditions

(number 7 and 8) accounted for 2 of the 10 diagnosis listed and 16% of the 383 level 4 patients.

TABLE 3a. AGE, MEAN + STANDARD DEVIATION BY TRIAGE LEVEL

Triage Level	1	2	3	4
n	43	49	821	1260
Mean+ SD	49+ 25.5	53+ 24.4	37+ 25.3	34+ 23.0

Significant between groups effect by ANOVA

TABLE 3b. AGE STRATIFIED INTO GROUPS (Mean + SD)

Age Groupings	Group I Urgents (level 1,2,3)	Group II Nonurgents (level 4)
n	913	1260
Mean+- SD	39+ 25.5	34+ 23.0*

*p<0.05, independent, 2 tailed *t* test

TABLE 3c. AGE FREQUENCIES STRATIFIED DISTRIBUTION BY TRIAGE LEVEL

Age	Triage Level 1	2	3	4	Totals	% Sample	% level 4	Mean Triage Level
1 to 17	7	5	192	326	530	24.4%	61.5	3.6
18 to 35	10	8	244	413	675	31.1%	61.2	3.6*
36 to 54	8	8	144	241	401	18.5%	60.1	3.5
55 to 64	5	7	70	103	185	8.5%	55.7	3.5
65 to99	13	21	171	177	382	17.6%	46.3	3.3**
Totals	43	49	821	1260	2173			

  * p<0.05, chi-square for urgent (level 1,2,and 3) vs. nonurgent (level 4)
** p<0.001, chi-square for urgent (level 1,2,and 3) vs. nonurgent (level 4)

Age distribution. The mean age for all groups was 35.2 years. The mean age for each triage

level is depicted in table 3a. ANOVA and subsequent Dunett post hoc test showed a significant

between groups effect for level 4 vs. levels 1,2, and 3 as depicted in table 3b. Therefore, levels

1,2,and 3 were grouped together to represent the urgent category and compared against level 4.

The age groups in table 3c. have very similar percentages of nonurgent utilization and mean

triage level except for the 55 to 64 and 65 and over age groups. These age groups account for a smaller percentage of the sample population, have lower percentages of nonurgent use and higher mean triage scores. This would suggest these groups of patients present less often with nonurgent conditions and when they do present are more acutely ill. Nonurgents (level 4) and urgents (levels 1,2, and 3) patients were compared using x^2 analysis, revealing statistically significant results for those in age groups 18 to 35 (p<0.05) and 65 to 99 (p<. 001).

TABLE 4. GENDER FREQUENCIES DISTRIBUTION BY TRIAGE LEVEL

Triage level	1	2	3	4	Total	% sample	% level 4	Mean Triage level
Female	18	15	421	680	1134	52.2%	60.0%	3.6
Male	25	34	400	579	1038	47.8%	55.8%	3.5*
Totals	43	49	821	1260	2173			

* p<0.05, chi-square for urgent (level 1,2,and 3) vs. nonurgent (level 4)

Gender. Females used the ER more frequently than male (52.2%, n=1134 versus 47.8% n=1038). In addition, females triaged had a higher percentage of level 4 when compared to the males (60% verses 55.8%). Males tended to be triaged with a slightly lower with a mean triage level of 3.5 verses 3.6 for females (p<0.05).

TABLE 5. BENEFICIARY CATEGORY FREQUENCIES BY TRIAGE LEVEL

Triage level	1	2	3	4	Total	% sample	% level 4	Mean Triage level
Beneficiary Category								
AD Dependents	10	9	291	489	799	36.7%	61.2%	3.6
Retired Dependents	9	7	162	248	426	19.6%	58.2%	3.5*
Active duty	4	2	127	213	346	15.9%	61.6%	3.6
Retired	9	15	120	171	315	14.5%	54.3%	3.4
Veterans Admin.	2	6	55	40	103	4.7%	38.8%	3.3***
Civilian Emergencies	8		6	4	18	0.83%	22.2%	2.3**
Total	42	39	761	1165	2007			

* $p < 0.05$, chi-square for urgent (level 1,2,and 3) vs. nonurgent (level 4)
**$p < 0.002$, chi-square for urgent (level 1,2,and 3) vs. nonurgent (level 4)
*** $p < 0.001$, chi-square for urgent (level 1,2,and 3) vs. nonurgent (level 4)

Beneficiary Category. The largest portion (n=799) of patients using the ER were clearly the

dependents of active duty, comprising 36.7% of the total population. The retired dependents had

the next highest utilization at 19.6% (n=426). Active duty had similar percentages of the sample

of ER patients as the retired at 15.9% (n=346) versus 14.4% (n=315). Each of these categories

have similar percentage of level 4 patients (60%) and mean triage level score of 3.6, with the

retired dependents having a slightly lower mean of 3.5. The retired categories (retired and

retired dependents), when grouped, comprise 34.1% of the ER population with approximately

56% nonurgent with retired dependents reaching statistical significance ($p < 0.05$). The

Department of Veterans Administration patients comprise only 4.7% of all ER patients, although

have by far the lowest percentage of nonurgents (38.8%) and the lowest mean triage level of all

eligible beneficiaries at 3.3 with an very statistically different finding ($p < 0.001$)between the

urgent and nonurgent population.   Civilian emergencies comprised only 0.8% of the sample and had a low mean triage category of 2.3.

TABLE 6. ENROLLMENT STATUS FREQUENCIES BY TRIAGE LEVEL

	Triage level							
	1	2	3	4	Total	% sample	% level 4	Mean Triage level
Enrollment Status								
AD Enrolled	2	2	103	164	271	12.5%	60.5%	3.6
CHAMPUS Eligible not Enrolled	5	3	99	176	283	13.0%	62.2%	3.6
CHAMPUS Eligible Enrolled	15	16	376	605	1012	46.6%	59.8%	3.6
Not CHAMPUS Eligible >65	10	20	164	219	413	19.0%	53.0%	3.4*
Totals	43	49	821	1260	2173	100.0%		

* $p<0.05$, chi-square for urgent (level 1,2,and 3) vs. nonurgent (level 4)

Enrollment Status. CHAMPUS eligible enrolled had the greatest number (n=1012) of users within the sample. All categories of enrollment status had nonurgent use of approximately 60% with a mean triage level of 3.5. Only the Not CHAMPUS Eligible was significantly different (p,0.05). This group has the lowest percentage of nonurgents in addition to the lowest mean triage level.

TABLE 7. GRADE/SPONSORS GRADE BY TRIAGE LEVEL

	Triage level				Total	% sample	% level 4	Mean Triage level
	1	2	3	4				
Grade/ Sponsors Grade								
E1 to E4	6	6	195	307	514	25.7%	59.7	3.6
E5 to E9	19	25	448	728	1220	61.0%	59.7	3.6
W1 to W5	3	2	27	40	72	3.6%	55.6	3.4
01 to 03	1	2	25	41	69	3.5%	59.4	3.5
04 to 08	3	6	41	74	124	6.2%	59.7	3.5
Totals	32	41	736	1190	1999	100.0%		

Grade/Sponsor's Grade. The grade or retired grade of E5 to E9 comprised 61% of the sample

population of ER patients. Lower enlisted grade E1 to E4 accounted for 25% of the sample.

With the exception of warrant officers who had slightly lower nonurgent use and slightly lower

mean triage levels, the percentage of level fours and mean triage level were consistent for the

other group at around 59% and 3.5 respectively. No statistically significant differences between

nonurgent and urgent population of the stratified age groups were identified. The missing 174

frequencies can be accounted for by Veterans Administration patients using the ER.

TABLE 8. THIRD PARTY HEALTH INSURANCE FREQUENCIES BY TRIAGE LEVEL

| | Triage Level | | | | | | | |
	1	2	3	4	Total	% sample	% level 4	Mean Triage Level
Third Party Insurance								
No	38	36	734	1166	1974	90.8%	59.1	3.5
Yes	5	13	87	94	199	9.2%	47.2	3.4*
Totals	43	49	821	1260	2173			

* $p < 0.002$, chi-square for urgent(level 1,2,and 3) vs. nonurgent (level 4)

Other Health Insurance. Surprisingly, 9.2% (n=199) of the predominately military beneficiary patient population did have third party health insurance and had less of a percentage of nonurgent conditions when compared to those without third party insurance. This group had 47.2% nonurgents and a low mean triage category of 3.4 with very statistically significant $p <$.002 difference between the urgent and nonurgent populations within the category.

TABLE 9. APPOINTMENT DAY OF WEEK BY TRIAGE LEVEL

	Triage Level							
	1	2	3	4	Total	% sample	% level 4	Mean Triage Level
Appointment Day								
weekday	32	42	646	950	1670	76.9%	56.9%	3.5
weekend	11	7	175	310	503	23.1%	61.6%	3.6
Totals	43	49	821	1260	2173			

Day of Visit. Weekday visits comprised 76.9% compared to the weekend use of 23.1%. This is representative of a cross-section of days selected for the sample population of 75% weekdays and 25% weekends. Percentages of nonurgents are relatively higher on the weekend at 61.6% versus 56.9% for weekdays and nearly reached statistical significance at p=0.058 for the two stratified groups. Mean triage categories are similar for both groups at 3.5 and 3.6.

TABLE 10. DISTANCE FROM MTF BY ZIPCODE FREQUENCIES BY TRIAGE LEVEL

		Triage Level							
		1	2	3	4	Total	% sample	% level 4	Mean Triage Level
ZIP CODE	Miles From MTF								
79924	6	11	10	201	274	496	23.8%	55.2	3.5
79904	3	4	11	110	163	288	13.8%	56.6	3.5
79906	2.5	1	2	78	89	170	8.2%	52.4	3.5
79936	11	2	3	44	93	142	6.8%	65.5	3.6
79925	6	5	2	41	92	140	6.7%	65.7	3.6
79934	9.5	3	3	44	65	115	5.5%	56.5	3.5
79916	2.5	2	2	38	65	107	5.1%	60.7	3.6
79930	1	4		30	58	92	4.4%	63.0	3.5
Totals		32	33	586	899	1550	74%		

TABLE 11. ZIP CODES WITHIN 40 MILES OF MTF BY FREQUENCY BY TRIAGE

LEVEL

| | Triage Level | | | | | | | |
	1	2	3	4	Total	% sample	% level 4	Mean Triage Level
ZIP CODES								
In Area	40	48	763	1150	2001	96.0%	57.5	3.5
Out of Area	1		30	53	83	4.0%	63.9	3.7
Totals	41	48	793	1203	2084	100%		

Distance from Hospital. Distances were calculated from the center of the greatest population

density within the zip code to the MTF to the nearest mile. Seventy four percent of the sample

population lived within 11 miles of the facility and can be accounted for by the eight zip codes

noted in table 10. In addition, 31.5% of this group lived within 3 miles of the hospital. Those

who lived the furthest away from the MTF have the highest mean triage category at 3.6. Table

11 is a summary of patients living within WBAMC catchment area, up to 40 miles from the

facility, consisting of 66 separate zip codes. Those living out of WBAMC catchment area,

beyond 40 miles from the MTF and exclusive of the 66 zip codes, are also reported. Ninety-six

percent of ER patients sampled lived within the catchment area and have a lower percentage of

nonurgent use and a lower mean triage level when compared to those from outside the catchment

area region. Statistical significance was not reached using X^2 technique.

TABLE 12. SHIFT ARRIVAL FREQUENCIES BY TRIAGE LEVEL

| | Triage Level | | | | | | | |
	1	2	3	4	Total	% sample	% Level 4	Mean Triage Level
Shift								
Day(0007-15)	24	27	345	623	1019	46.9%	61.1%	3.5*
Evening (1501-2300)	12	18	386	540	956	44.0%	56.5%	3.5
Night (2301-0659)	6	4	90	96	196	9.0%	49.0%	3.4*
Totals	43	49	821	1260	2173	100.0%		

* p<0.01, chi-square for urgent (level 1,2,and 3) vs. nonurgent (level 4)

Time of Visit. Depicted in table 12 nearly 47% (n=1019) of the sample were seen in the ER during the day shift with 61.1% nonurgent. Evening shift patient presentation was similar to that of day shift regarding total, % sample, % level 4, and mean triage level. Night shift saw the fewest patients with a lower percentage of level 4 and with the lowest mean triage level of 3.4. Mean arrival time using nominal data was 13:54. Statistical significance (p,0.01)was reached for both the day and night shift using χ^2 technique.

TABLE 13. DISPOSITION FREQUENCIES BY TRIAGE LEVEL

	Triage Level							
	1	2	3	4	Total	% sample	% Level 4	Mean Triage Level
Disposition								
Admitted	17	16	92	7	132	6.1%	5.3%	2.7*
Expired	2				2	0.1%	0.0%	1.0
Immediate Referral	2	4	33	392	431	19.8%	91.0%	3.9**
Left against medical advice			2		2	0.1%	0.0%	3.0
Released with limitations	3	4	105	139	251	11.6%	55.4%	3.5
Released with out limitations	19	23	548	675	1265	58.2%	53.4%	3.5**
Sick at quarters		2	41	47	90	4.1%	52.2%	3.5
Total	43	49	821	1260	2173	100%		

* p<0.0001, chi-square for urgent (level 1,2,and 3) vs. nonurgent (level 4)
** p<0.0000, chi-square for urgent (level 1,2,and 3) vs. nonurgent (level 4)

Disposition. Most notable are the patients given immediate referrals for a same day appointment within WBAMC. These patients comprise nearly 20% of the sample population with 91% level 4 and a very high mean triage level of 3.9. Over half (58.2%) of the ER population were released without limitation and of this population 53.4% were nonurgent. Only 0.5% (n=7) of the nonurgent patients were admitted. Three categories: admitted, immediate referral, and released without limitations were found to have a very statistically significant difference at p<.0001 and p<.0000.

TABLE 14. SUMMARY TABLE. TOP FREQUENCIES FOR 12 VARIABLES ANALYIZED

IN ER VISITS

	Triage Level							
	1	2	3	4	Total	% Sample	% Level 4	Mean Triage Level
Sprain/ Strain	1		31	62	94	4.3%	66%	3.6
18 to 35 yrs	10	8	244	413	675	31.1%	61.2%	3.6
Female	18	15	421	680	1134	52.2%	60.0%	3.6
AD Dependents	10	9	291	489	799	36.7%	61.2%	3.6
CHAMPUS Eligible Enrolled	15	16	376	605	1012	46.6%	59.8%	3.6
E5 to E9	19	25	448	728	1220	61.0%	59.7%	3.6
No TPI	38	36	734	1166	1974	90.8%	59.1%	3.5
weekday	32	42	646	950	1670	76.9%	56.95	3.5
Zip 79924	6	11	10	201	274	23.8%	55.2%	3.5
In Area	40	48	763	1150	2001	96.0%	57.5%	3.5
Day(07-15)	24	27	345	623	1019	46.9%	61.1%	3.5
Released without limitations	19	23	548	675	1265	58.2%	53.4%	3.5

Summary Table.   Table 14 shows the typical profile of ER usage in the 7-month study period.

The typical profile of ER usage by frequency showed the greatest usage by female active duty

dependents between the ages of 18-35 who are CHAMPUS eligible and enrolled in TRICARE.

This profile also depicts the typical user as someone who presents with a sprain or strain on a

weekday during the hours of 0700-1500. This profile also shows the person or sponsor to be

between the rank of E5 and E9 with no third party insurance, lived in zip code 79924 (6 miles

from WBAMC) and is released without limitation after being treated in the ER.

This study and accompanying table and result shows some stratified categories within the 12 independent variables such as gender, age, beneficiary category are stronger predictors of nonurgent use than others diagnosis such as, enrollment status, and distance from the MTF.

DISCUSSION

The purpose of this study was to critically examine emergency room utilization and descriptive characteristics of patients seen with nonurgent conditions at a major medical center within the Military Health System (MHS). The results are notable. The registered nurses on duty during the selected dates triaged 58% of the sample (1260 of 2173) as nonurgent (level 4). These nonurgent patients may be candidates for referral to a more appropriate level of care, typically primary care, without a significant risk for deterioration of their condition. This study supports and quantifies a widely held belief among practitioners and administrators that a preponderance of ER visits are for conditions regarded as nonurgent. Furthermore, it is thought that if identified this population could be targeted for initiatives aimed at self-care education, utilization of telephone advice and triage and other outpatient medical management programs. Patients placed in level three accounted for 37.8% (n=821) of the population triaged, these patients are considered stable, but require treatment within 24 hours. The remaining level two (urgent) and level one (emergent) patients accounted for only 2.3% (n=49) and 2.0% (n=43) respectively.

Findings revealed 58% nonurgent utilization which is slightly higher than that reported by other studies. In particular, the 1992 National Hospital Ambulatory Medical Care Survey and, more recently, the Derlet et al. (1996) nationwide study, support nonurgent use between 50 and 55.4%.

Both nonurgent utilization of 58% and the mean triage score of 3.5 are considered high when compared with other MTFs. A comparison based on current research is difficult considering the lack of published benchmarks regarding nonurgent utilization in the MHS. In an unpublished 1996 study of ER utilization at Reynolds Army Community Hospital (RACH), Fort Sill, Oklahoma, the percentage of nonurgent utilization was 66.2% one year prior to TRICARE implementation. The results were based on a 9-day sample during a three-month period preceding TRICARE. The same three months were studied after TRICARE implementation and revealed a decrease in nonurgent use to 38.5%. The adjusted mean triage score for these patients was 3.36 pre-TRICARE and 2.58 post-TRICARE. In addition to the small sample size, there were some significant changes regarding the triage procedures during data collection phase. This may have weakened the rigor of study results. Comparing these two facilities is difficult considering the size of RACH, a small medical department activity (MEDDAC) in rural Oklahoma, and WBAMC, a large teaching hospital in a metropolitan city.

WBAMC has not experienced as significant a decrease in ER volume as other MEDCENs have in relation to the implementation of TRICARE. WBAMC anticipated a decrease in nonurgent use as a result of empanelinging beneficiaries to primary care managers (PCM). The PCM, in theory, would provide coordination and a greater degree of continuity in the primary care system that has historically been fragmented. WBAMC, since the implementation of TRICARE in April 1997 has only experienced an 8.2% decrease in volume from April 1997 to April 1998 (MEPERS, 1999). Madigan Army Medical Center (MAMC) in Fort Lewis, Washington, like WBAMC, is a large teaching hospital in a metropolitan city. MAMC experienced a statistically significant decrease of 20.2 percent in ER utilization nine months after the implementation of TRICARE (Gramel, 1996, unpublished graduate project).

The months used for comparison were not identical and subject to a number of confounding factors affecting ER utilization and this unequal comparison may have weakened the results. Again, comparing WBAMC to other MTFs considering the known research done to date is very difficult. A study involving multiple facilities over a year time using a common study design could provide a valuable benchmarking tool for comparisons between facilities.

Enrollment in TRICARE Prime appears to have minimal effect on ER utilization for nonurgent conditions at WBAMC. By definition those enrolled in TRICARE Prime have an assigned PCM and a regular source of care. Those not enrolled, less than 65 years of age, have a slightly higher (2%) nonurgent use of the ER than patients enrolled in TRICARE. This finding, although not statistically significant, supports the research of Haddy, Schmaler, and Epting (1987) that concluded that patients not having regular physicians presented to the ER with non emergent conditions more frequently than patients who had physicians (85.8 percent vs 78.4 percent, P<0.05). Ironically, those not enrolled in TRICARE, over 65 years have a lower percentage of nonurgent use (53%) and the lowest mean triage score of 3.4, both statistically significant (P<0.05). A possible explanation could be this group is more judicious when using emergency services and are more likely to present with true urgent conditions. More likely, this group when presenting to the ER has comorbidities and chronic conditions that elevate their triage level. What is unknown is the number of patients over 65 years in the WBAMC system that have a regular physician and what effect that has on nonurgent ER utilization. WBAMC has recently opened a blood pressure, medication refill, coumadin and diabetes clinic to provide access to these services which are primarily utilized by those over 65 years.

Analyzing the diagnoses revealed trends regarding the incidence of particular nonurgent conditions seen in the ER. The top diagnosis among nonurgent users was International Classification of Disease 9th Revision (ICD-9) code 848.9, sprains and strains, unspecified site. Similar ICD-9 codes were grouped to expand the analysis and look for trends beyond each individual ICD-9 code. When grouped with similar ICD-9 diagnoses (coded 800-999) as depicted in chapter 17 of the ICD-9 manual, Injury and Poisoning, this group accounted for 25.7% (n=560) of the entire ER population sampled (n=2,173). The percentage nonurgent and the mean triage category were identical to the overall population studied at 57.9% and 3.5 respectively. This indicates the acuity of the diagnosis sprain/strain and those grouped by the chapter "Injury and Poisoning" are similar and also consist of equal percentages of nonurgent patients. Two of the top 10 diagnoses in the ER are respiratory in nature, acute upper respiratory infection and acute bronchitis. When viewed as an entire group, diseases of the respiratory system (ICD-9 codes 460-466) account for 12% (n=279) of the entire ER sample. Like sprain/strains the nonurgent percentage and mean triage level of the respiratory diseases mirrored the sample population with nearly 60 % nonurgent (n=167). The final diagnosis alone does not depict the seriousness of the condition upon presentation, but the triage assessment by the registered nurse does provide the degree of urgency upon presentation to the ER. This study incorporates what other studies have noted as limitations. A number of studies have cited great difficulty in identifying the nonurgent population using ICD-9 codes as criteria (Kravits et al. 1998; Gill and Reese, 1995; O'brien, Shapiro, Woolard, 1996). By incorporating the triage level with the diagnoses this study was able to accomplish what other studies have cited as limitations.

The mean age of 35 years for the ER population sampled is consistent with finding in the general literature (Baker, Stevens, Brooks, 1995; Baum and Rubenstein, 1987), however is higher than two unpublished ER studies involving military populations (Gramel,1996; Castro, 1993). The findings in these two studies revealed the mean age of a military population utilizing emergency services is typically around 25 years of age. The large proportion of retired military in the El Paso area may account for the increase in age when compared to other MTFs. Thirty-one percent of the WBAMC sample population was between 18 and 35 years. This finding is consistent with research in the military as well as the civilian community.

An urban study involving primary care and ER overcrowding revealed 38% of the patients seen in the ER were willing to trade their ER visit for an appointment in a clinic within 3 days (Grumbach, Keane, and Bindman, 1993). A relatively small number (20%, n=431) of the patients seen in the WBAMC ER during this study were given the disposition "immediate referral." These patients with nonurgent conditions (91%) were given same day appointments within WBAMC primary care. Typically these appointments are made with practitioners in the General Outpatient Clinic (GOC) or to a lesser extent in Adult Primary Care (APC) or Pediatrics. Their mean triage level (3.89) is considerably higher than the overall sample population of 3.5. The ER triage nurse typically attempts to triaging out or fast-tracking these patients to a more appropriate site for care within the facility. By definition, level 4 patients are stable and require treatment when available and are not at significant risk for deterioration if treatment is delayed. Using this as criteria, the vast majority of nonurgent patients could be seen in the outpatient setting in one of the clinics mentioned above. Upon closer examination the majority of the nonurgent ER patients n=623, (47% of nonurgent population) were seen during the day when typically clinics are operational. It remains unknown why patients are accessing the ER for

nonurgent conditions during the operational hours of the primary care clinics. Are patients

coming directly to the ER without attempting to access primary care or are they seeking care

after unsuccessful attempts to access primary care, are they being referred to the ER? Although

nonurgent conditions are generally inappropriate for ER care, this may be a patients only known

option if there is difficulty accessing primary care in a timely fashion. The ER triage nurse has

access to on average 5 appointments each day that are specifically for fast-tracking from the ER

to primary care (personal communication, Joann Mack, WBAMC NAL nurse, 23 April, 1999).

According to Ms. Mack, former WBAMC ER staff nurse until April of this year, these

appointments are quickly filled by nonurgent patients and typically the demand exceeds the

number of same day appointments requested by the ER triage nurse. WBAMC is challenged

with responding to patients' problems in a timely and accessible fashion for nonurgent

conditions. According to Ms. Mary Ancker, WBAMC TRICARE Contracting Officer Technical

Representative, WBAMC is experiencing difficulty in consistently meeting access standards for

TRICARE Prime beneficiaries for same day or at times (cold/flu season) next day appointments.

Percentages of patients not receiving appointments within the access standard were unavailable.

(personal communication, Mrs. Mary Ancker, 23 April, 1999)

Recently the leadership of WBAMC implemented an in-house nurse advice line (NAL) to

provide patients another means of accessing the healthcare system. The current TRICARE Line

for Care (TLC) was not providing the level of specificity our beneficiaries need for an adequate

evaluation and the TLC did not have direct appointing ability to WBAMC primary care clinics.

Therefore, WBAMC created the NAL which utilizes the Centramax M. Plus® software package,

qualified registered nurses, 13 hours per day, to provide patients with a systematic evaluation of

their condition and if necessary access to primary care appointments. Taking into account the

aforementioned results of this study, the clinical and demographic make up of the nonurgent ER

population will benefit from the NAL. Conservatively, the 63% of the nonurgents seen during

clinic hours could be triaged over the phone as opposed to in the ER and given same day

appointments if necessary. In addition, the large numbers of patients with nonurgent

sprains/strains, rashes, colds and other conditions such as viral infections are candidates for

management through the NAL. The NAL will be a powerful tool for the management of a large

numbers of cases identified in this study. Furthermore, according to LTC Hill, nurse manager

WBAMC ER, a prescreening process will be implemented in the very near future to channel

nonurgent patients to the NAL prior to patients signing into the ER. According to her this will

facilitate the use of the NAL and leverage the value of the service by providing self-care and

assisting the patient in accessing the system at the appropriate level. (personal communication,

23 April, 1999)

Limitations.

Verifiable "gold standards" for triage do not exist (Brillman , Dozezema, Tanberg, Sklar,

and Skipper, 1997). Triaging determinations may vary by individual nurse, experience, training,

ER workload, and the influence or participation of the attending physician. This study did not

address this variation. However, there is no reason to suspect the triage process and the definition

of a nonurgent case changed during or since the data collection period.

The prospective triage category was chosen for this study as the outcome variable for

each patient and this outcome variable may possibly be viewed as a limitation because of the

prospective nature of the assignment of triage level. The potential for serious illness is the

crucial determinant in the triage process, therefore the level of triage cannot be determined by

retrospective analysis from the final diagnosis. Using the final diagnosis as the outcome may

have 1) seriously understated the seriousness of patients presenting and the necessity for timely

full ER evaluation and 2) seriously overstated the volume of nonurgent users of the ER. The

judgement of the nurse at time of patient presentation is most indicative of the urgency of

treatment. The classic example is best illustrated by the patient presenting with chest pain. Only

after a thorough cardiac evaluation is the patient diagnosed with indigestion.

The data for the study was collected from 28 random days from June to December 1998

at a single MTF. This small sample size is a second limitation. Random sampling over this

seven-month period was considered to be a representative of the numbers and types of patients

seen throughout the year. Certainly the study can be strengthened by an expanded analysis over

a twelve-month period or, multiyear study.

A third limitation of the study is the significant amount of missing data. Of note is the

incomplete ADS data. For the study date 12 July, a Sunday, only 18 ADS patient files were

retrieved from the database. The remaining 100 patients logged into the ER for that day did not

have ADS data in the system. WBAMC ADS specialists were unable to explain why this large

number of patients were unaccounted for in the system.   In an effort to maintain the integrity of

the entire database for all days selected the 18 files from 12 July were eliminated from the study.

There were a large number of patients with no triage classification (n=337, 70% of the 485

excluded). This situation is typically a cross section of patients whom are either obviously an

emergency or urgent and taken directly into the treatment area or those with obvious nonurgent

complaints that are immediately directed to the outpatient clinic. In situations where there is an

opening for a walk in appointment within the hour the patient is directed to go immediately to

the primary care clinic and a triage level is occasionally not documented. The cross section of

emergent, urgent, and nonurgent populations have an equal likelihood of not having the triage documented and does not seriously jeopardize the integrity of the study.

The independent variable "duty station" was elimated from analysis due to the wide variation within the data field. The field dedicated to duty station of the sponsor is a free text field within CHCS. Data which is extracted from CHCS into ADS regarding duty station had a significant amount of variation which consisted of patients within the same unit being entered using multiple variations of the same unit name. The wide variation hindered statistical analysis despite efforts to recode the data within this field.

The disposition field, specifically the left without being seen category, within ADS has obvious limitations regarding data completeness. Of the 2,173 patients studied only two were identified in ADS as left without being seen. This is an extremely low number considering the national average is approximately 1 to 3 %. A review of the ER Ad Hoc report revealed 61 patients (2.8% of sample) had left without being seen. Revisiting each SF558 would provide the most accurate information. Obviously ADS has serious limitations regarding this important category of disposition. When patients do leave without being seen it is likely the ADS sheet is not thoroughly completed. Although not examined as part of this study, the number of patients leaving without having a full evaluation may have a strong correlation with high workload and prolonged waits in the ER.

CONCLUSION AND RECOMMENDATIONS

Conclusions

The object of this study was to determine the percentage of patients seen in the WBAMC ER for conditions triaged as nonurgent during a seven-month period of time. Additionally, the

study desired to determine if 12 independent variables were associated with nonurgent utilization of the ER. This study achieved both objectives and is considered a successful project and a positive contribution to WBAMC and the Army Medical Department.

The typical profile of ER usage by frequency showed the greatest usage by female active duty dependents between the ages of 18-35 who are CHAMPUS eligible and enrolled in TRICARE. This profile also depicts the typical user as someone who presents with a sprain or strain on a weekday during the hours of 0700-1500. This profile is further typified by a person or sponsor between the rank of E5 and E9 with no third party insurance, lived in zip code 79924 (6 miles from WBAMC) and released without limitation after being treated in the ER.

The results of this study provide the leadership of WBAMC with valuable information about the clinical and demographic make up of patients presenting to the ER with nonurgent conditions. In addition, this study provides a model for future analysis that will quantify and validate the impact of many positive organizational changes presently being implemented at WBAMC.

This study strengthens and quantifies the long-standing belief regarding the prevalence of nonurgent use in the ER at WBAMC. The results can be incorporated into future analysis of primary care and the demand for nonurgent care, as well as, ER staffing mix related to the population seen. This study showed that nonurgent use in the ER can be predicted to some degree using the 12 variables analyzed.

Recommendations

The triage level of each patient should be entered into the ADS system. This can be accomplished by simply utilizing one of the customizable fields; the triage category could be given space on the ADS bubble sheet. By entering the level into the system the continuation and

expansion of this study would be fully automated. Further, analysis should include access and availability of the primary care clinics. Evaluation of the NAL and other demand management efforts could utilize this study design.

An additional code for PCM location should be added to the ADS. Presently within ADS the location of the PCM is not provided. This is crucial in the overall evaluation of WBAMC's population. Being a medical center with 24-hour access in addition to a large referral center, analysis on those patients empanelled to WBAMC is difficult. Providing this code will clarify the empanelled population served for those empanelled to the TRICARE network.

Formalizing the data entry of each sponsors unit would faciliate future analysis of the Active Duty population on Fort Bliss. This could be accomplished with the assistance of the WBAMC health benefits advisors in conjuction with TRICARE enrollement staff. Additionally, the unit identificatin code (UIC) could be leveraged within the CHCS system through a cross over patch to ADS and allow the UIC to be placed within ADS.

Evaluating the staffing mix in the ER is essential to improving the efficiency of the system. An analysis and subsequent implementation of staffing patterns and mix that is congruent with the urgency and mix of cases presenting to the ER will maximize the utility of each staff member.

The ER should review the SOP regarding triage. Dialog with other MTFs and standardization is recommended. In addition, to standardizing the triage process WBAMC and other MTFs should agree upon a common design for analysis of nonurgent in the ER. Standardizing data collection techniques and methods of analysis will facilitate benchmarking across and between the MTFs.

REFERENCE LIST

Alpert J.J., Kosa J., and Haggerty R.J (1969) The types of families that use an emergency room. Medical Care 7, 55-59.

Andren K.G. and Rosenquist U. (1987) Heavy users of an emergency department: A two-year follow-up study. American Journal of Public Health 25(8), 825-831.

Anson O., Carmel S., and Levin M., (1991). Gender Differences in the utilization of emergency department services. Women and Health 17(2), 91-104.

Baker D.W., Stevens C.D, and Brooks R. (1991) Patients who leave a Public Hospital Emergency Department without being seen by a Physician. Journal of the American Medical Association 266(8), 1085-1090.

Baker D.W., Stevens C.D, and Brooks R. (1994). Regular source of ambulatory care and medical care utilization by patients presenting to a public hospital emergency department. Journal of the American Medical Association. 271(24), 1909-1912.

Baker D.W., Stevens C.D, and Brooks R. (1995) Determinates of emergency department use by ambulatory patients at an urban public hospital. Annals of Emergency Medicine 25(3), 311-316.

Barnet A. (1995) Is knowledge really power for patients? Business & Health 13, 29-36.

Baum S., Rubenstein L. (1987) Old people in the emergency room: Age-related differences in emergency department use and care. Journal of the American Geriatric Society 35, 398-404.

Berkanovic E., Tleseky T., and Reeder J. (1981) Structure and Social psychological factors in the decision to seek medical care for symptoms. Medical Care 19, 693-709.

Birnbaum A., Gallagher E.J., Utkewicz M., Gennis P., Carter P. (1994) Failure to validate a predictive model for refusal of care to emergency department patients. Academic Emergency Medicine 1, 213-217.

Brillman J.C., Doezema D., Tanberg D., Sklar D.P., and Skipper B.J. (1997) Does a Physicians Visual Assessment Change Triage. American Journal of Emergency Medicine. 15(1), 29-33.

Brumfield B. (1995) Help lines reduce unnecessary trips to the emergency room. Milwaukee 30, 31-36.

Brown E., and Goel V. (1994). Factors related to emergency department use: Results from the Ontario health survey 1990. Annals of Emergency Medicine 24(6), 1083-1091.

Buchanan L., Powers RD. (1996) Establishing a NP-staffed minor emergency area. Nurse Manager 27 (2): 25-31.

Buesching D.P., Jablonowski A., and Vesta E. (1985) Inappropriate emergency department visits. Annals of Emergency Medicine 14(7), 672-673.

Callendar D.B. (1994). The TRICARE Era in Military Medicine. The Air Force Magazine, 3, 12-15.

Castro R. (1993) An analysis of patient waiting times in the emergency room at Martin Army Community Hospital, Fort Benning, Georgia. Graduate Project Unpublished manuscript. Baylor University.

Cooper D.R., Emory C.W. (1995) Business Research Methods (5th ed.) Business Research Methods Boston: Irwin Publishing.

Derlet R.W., Kinser D., Ray L., Hamilton,B. and McKenzie J. (1995) Prospective Identification and Triage of Nonemergency Patients Out of an Emergency Department: A 5-Year Study. Annals of Emergency Medicine 25(2), 215-223.

Derlet R.W. and Nishio D.A. (1990) Refusing care to patients who present to an emergency department. Annals of Emergency Medicine. 19(3), 262-267.

Fries J.K., Koop C.E., Beadle C.E., Cooper P.P., England M.J., Greaves R.F., Sokolov J.J., and Wright D., (1993) Reducing health care cost by reducing the need and demand for medical services. New England Journal of Medicine. 329, 321-325.

Gadmoski A.M., Perkis V., Horton L., Cross L., and Stanton B. (1995). Diverting managed care Medicaid patients from pediatric emergency department use. Pediatrics 95(2), 170-178.

Gamerl J.M.(1996) A Comparative analysis of emergency room utilization before and after TRICARE implementation. Reynolds Army Community Hospital Fort Sill, Oklahoma. Graduate Project Unpublished manuscript. Baylor University

Gill J.M., and Reese C.L. (1995) Disagreement among health professionals about urgency in emergency department patients (abstract). AHSR/FHSR Annual meeting abstract book 1995; 12, 143   (From Kravitz R., Zwanziger J., Hosek S., Polish S., Sloss E., McCaffery D., (1998) Effects of a large managed care program on emergency department use: results from the CHAMPUS Reform Initiative Evaluation. Annals of Emergency Medicine. 31(6), p. 744

Gill J.M., and Riley A.W. (1996) Nonurgent use of hospital emergency departments: urgency from the patient's perspective. The Journal of Family Practice 42 (5), 491-496

Grumbach K., Keane D., and Bindman A. (1993) Primary care and public emergency department overcrowding. <u>American Journal of Public Health</u> 83, 372-378.

Haddy R., Schmaler M., and Epting R. (1987) Nonemergency emergency room use in patients with and without primary care physicians. <u>Journal of Family Practice</u> 24 (4), 389-392.

Hansagi, H., Carlsson B., Brismar B., (1992) The urgency of care needed and patient satisfaction at a hospital emergency department. <u>Health Care Management Review</u> 17 (2), 71-75.

Holly J.E., Kellermann A.L., and Andrulis D.P. (1992). Physician staffing in the emergency departments of public teaching hospitals: A national survey. <u>Annals of Emergency Medicine</u>. 21, 53-57.

Hospital Statistics: Emerging trends in hospitals 96/97. American Hospital Association, Chicago, Illinois. 1996

Jacobs A.R., Gavett J.W., and Wersinger R. (1991) Emergency Room utilization in an urban community. <u>Journal of the American Medical Association</u> 216, 307-312.

Krakau I., and Hassler E. (1999) Provision for clinic patients in the ED produces more nonemergency visits. <u>American Journal of Emergency Medicine</u> 17(1), 18-20.

Kravitz R., Zwanziger J., Hosek S., Polish S., Sloss E., McCaffery D. (1998) Effects of a large managed care program on emergency department use: Results from the CHAMPUS Reform Initiative Evaluation. <u>Annals of Emergency Medicine</u> 31(6), 741-747.

Lehmann C.U., Barr J., and Kelly P. (1994). Emergency department utilization by adolescents <u>Journal of Adolescent Health</u> 15(6), 485-490

Lowe R.A., Bindman A.B., Ulrich S.K. (1994) Refusing care to emergency department patients: Evaluation of published triage guidelines. <u>Annals of Emergency Medicine</u>. 23(2), 286-293.

Medical Expense and Performance Reporting System (MEPRS). William Beaumont Army Medical Center, Fort Bliss, Texas. Medical 302 Report, 1 April 1999.

National Hospital Ambulatory Medical Care Survey: 1992 Emergency Department Survey. Hyattsville, MD: <u>National Center for Health Statistics</u> (1994) 245:1-12

Office of the Inspector General: Controlling Emergency Room Use: State Medicaid Reports (1991). Washington DC: OEI, 1991:06-90-00181

O'brien G.M., Stein M.D., Zierler S., Shapiro M., O'Sullivan P., and Woolard R. (1997). Use of the ED as a regular source of care: associated factors beyond lack of health insurance. <u>Annals of Emergency Medicine</u> 30(3), 286-291.

O'brien G.M., Shapiro M., Woolard R. et al.. (1996). Inappropriate emergency department use: A comparison of three methodologies for identification Academic Emergency Medicine 3, 252-257. (From Kravitz R., Zwanziger J., Hosek S., Polish S., Sloss E., McCaffery D., (1998) Effects of a large managed care program on emergency department use: results from the CHAMPUS Reform Initiative Evaluation. Annals of Emergency Medicine. 31(6), p.744)

O'Grady KF, Manning WG, Newhouse JP, Brooks RH, (1985) The Impact of Cost Sharing on Emergency Department Use. New England Journal of Medicine. 313(8), 484-490.

Oyster C.K., Hanten W.P., and Llorens L.A. (1987) Introduction to Research: A guide for the health science professional. New York: J.B. Lippencott Company.

Pane G.A., Farner M.C., and Salness K.A. (1991) Health care access problems of medically indigent walk-in patients. Annals of Emergency Medicine 20, 730-733.

Padgett D. and Brodsky R. (1992) Psychosocial factors influencing non-urgent use of the emergency room: A review of the literature and recommendations for research and improved service deliver. Social Science and Medicine 35, 1189-1197

Partridge P. (1996). Demand management moving to the forefront. Health Care Strategic Management 14, 14-16.

Rhee K.J., Dermyer A.L., (1995) Patient satisfaction with a nurse practitioner in a university emergency services. Annals of Emergency Medicine 26, 130-132.

Schesser R., Kirsch T., Smith J., and Hirsch R. (1991). Analysis of emergency department use by patients with minor illness. Annals of Emergency Medicine 20(7), 743-748.

Selby JV, Fireman BH, Swan BE, (1996) Effects of a copayment on use of the Emergency Department in a Health Maintenance Organization. New England Journal of Medicine 334(10), 635-641.

Shortliffe E., Hamilton T., and Nororuse E., (1958) The Emergency Room and the changing pattern of medical care. New England Journal of Medicine 258, 20-25.

Simon H.K., Ledbetter D.A.,and Wright J., (1997) Societal saving by "Fast Tracking" lower acuity patients in an urban pediatric emergencydDepartment. American Journal of Emergency Medicine 15 (6), 551-554.

Spatz C. (1993) Basic Statistics: Tales of Distribution (5th ed.) Pacific Grove, California: Brooks/Cole Publishing Company

Steinweg K.K., Killingsworth R.E., Nannini R.J. and Spayde J. (1998) The impact on a health care system of a program to facilitate self-care. Military Medicine 163, 139-144.

Stevens C.D., Baker D.W., Brooks R.H., (1991) Patients who leave the Emergency Department without medical evaluation: Severity of illness and need for acute care. <u>Annals of Emergency Medicine</u> 20, 444-450.

Sturmann K.M., Ehrenberg K., and Salzberg M.R., (1990) Physician assistants in emergency medicine. <u>Annals of Emergency Medicine</u> 19, 304-308.

Tandburg D. and Qualis C. (1994). Time series forecast of emergency department patient volume, length of stay, and acuity. <u>Annals of Emergency Medicine</u> 23(2), 299-306.

Terry P.E. and Pheley J.(1993) The effects of self-care brochures on the use of medical services. <u>Journal of Occupational Medicine.</u> 35, 422-426.

US General Accounting Office: Emergency Departments: Unevenly Affected by Growth and Change in Patient Use (GA)/HRD 93-4) (1993) Gaithersburg, MD: US General Accounting Office, Human Resources Division.

Vickery D.M., Kalmer H., Lowry M.S., Constantine M., Wright E., and Loren W. (1983) Effect of a self-care education program on medical visits. <u>Journal of the American Medical Association</u> 250(21), 2952-2955.

Vickery D.M., and Lynch W.D. (1995). Demand management: Enabling patients to use medical care appropriately. <u>Journal of Emergency Medicine</u> 37(5), 551-557.

Walsh M. (1990) Patient's Choice: GP or A&E department? <u>Nursing Standard</u> 28(5), 28-31.

William Beaumont Army Medical Center (1999). WBAMC Strategic Plan. Unpublished manuscript. WBAMC, Fort Bliss, Texas.

White H.A., and O'Connor P.A. (1970) Use of emergency rooms in a community hospital. <u>Public Health Report</u> 85. 163-168.

Young G.P., Wagmer M.B., Kellermann A.L., Ellis J., and Bouley D. (1996) Ambulatory visits to hospital emergency departments: Patterns and reasons for use. <u>Journal of the American Medical Association</u> 276(6), 460-465.